Amendments to the Claims:

1-14. (canceled)

15. (currently amended) A method for forming an interconnect structure on a substrate, the method comprising the steps of:

depositing a dielectric layer, said dielectric layer being formed of a carbon-containing dielectric material having a dielectric constant of less than about 4;

depositing a hardmask layer on said dielectric layer, said hardmask layer having a top surface;

forming an opening in said dielectric layer and said hardmask layer;

filling said opening with a conductive material, thereby forming a conductor, said conductor having a surface coplanar with the top surface of said hardmask layer;

exposing said conductor to a reducing plasma comprising at least one gas selected from the group consisting of H_2, N_2, NH_3 and noble gases, thereby forming a pre-clean layer, said pre-clean layer comprising copper, silicon and oxygen; and

depositing silicon nitride ~~on said conductor~~ by a plasma-enhanced chemical vapor deposition (PE CVD) process, thereby forming a silicon nitride cap layer.

16. (original) The method according to Claim 15, wherein said hardmask layer is formed of silicon nitride, and is deposited by a chemical vapor deposition (CVD) process.

17. (original) The method according to Claim 15, wherein said hardmask layer is formed of silicon carbide, and is deposited by a chemical vapor deposition (CVD) process.

18. (original) The method according to Claim 15, wherein said conductor is exposed to a reducing plasma comprising NH_3 at a flow rate of at least about 4000 sccm.

19. (original) The method according to Claim 15, wherein said conductor is exposed to a reducing plasma with a high frequency RF power of about 150 watts to about 450 watts and a low frequency RF power of about 100 watts to about 300 watts.

20. (previously presented) The method according to Claim 15, wherein said conductor is exposed to a reducing plasma in a chemical vapor deposition (CVD) reactor at a pressure of less than about 20 torr, and said silicon nitride cap layer is deposited in the same CVD reactor at a pressure of less than about 10 torr without interruption of vacuum atmosphere.

21. (previously presented) The method according to Claim 15, further comprising the steps of:

depositing a silicon nitride film on said hardmask layer, and

depositing a silicon oxide film on said silicon nitride film.

22. (previously presented) The method according to Claim 21, wherein said silicon nitride film is deposited in a CVD reactor at a pressure of about 0.1 to 10 Torr, using at least one gas selected from the group consisting of SiH_4, NH_3, N_2 and He.

23. (previously presented) The method according to Claim 21, wherein said silicon nitride film has a composition of about 41 atomic % silicon, about 41 atomic % nitrogen, and about 17.5 atomic % hydrogen.

24. (previously presented) The method according to Claim 21, wherein said silicon oxide film is deposited in a CVD reactor at a pressure of about 0.1 to 10 Torr,

using at least one gas selected from the group consisting of SiH_4, N_2O, N_2 and O_2.

25. (previously presented) The method according to Claim 21, wherein said silicon oxide film has a composition of about 33 atomic % silicon, about 63 atomic % oxygen, and less than about 1 atomic % hydrogen.

26. (currently amended) The method according to Claim 15, further comprising the step of depositing a conductive liner in said opening prior to filling said opening with the ~~a~~ conductive material.

27. (previously presented) The method according to Claim 15, further comprising the step of depositing an adhesion promoter layer on said substrate prior to depositing said dielectric layer.

28. (previously presented) The method according to Claim 15, wherein said dielectric layer is formed of an organic thermoset polymer having a dielectric constant of about 1.8 to about 3.5.

29. (previously presented) The method according to Claim 23, wherein said dielectric layer is formed of a polyarylene ether polymer.

30. (previously presented) The method according to Claim 15, wherein said silicon nitride cap layer has a composition of about 37 atomic % silicon, about 45 atomic % nitrogen, and about 15 atomic % hydrogen.

31. (previously presented) The method according to Claim 16, wherein said hardmask layer has a composition of about 30 to 45 atomic % silicon, about 30 to 55 atomic % nitrogen, and about 10 to 25 atomic % hydrogen.

32. (previously presented) The method according to Claim 17, wherein said hardmask layer has a composition of about 27 atomic % silicon, about 36 atomic % carbon, and about 37 atomic % hydrogen.

33. (previously presented) The method according to Claim 15, wherein said conductor is exposed to a reducing plasma at a temperature of about 20 to about 600 °C, for a time of about 1 to about 3600 seconds, at a pressure of about 1 mTorr to about 20 Torr, with a high frequency RF power of about 150 watts to about 450 watts, a low frequency RF power of about 100 watts to about 300 watts, and a gas flowrate of about 1 to about 10,000 sccm.

34. (new) The method according to Claim 15, wherein said pre-clean layer further comprises at least one of carbon, hydrogen, nitrogen and fluorine.